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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|-----------------|-------------|--------------------------|-----------------------|------------------|
| 10/785,328 | 02/24/2004 | Cesar A. Galindo-Legaria | MSFT-3515 (138320.02) | 9709 |

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EXAMINER

VEILLARD, JACQUES

| ART UNIT | PAPER NUMBER |
|----------|--------------|
|----------|--------------|

2175

DATE MAILED: 08/12/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/785,328

Applicant(s)

GALINDO-LEGARIA ET AL.

Examiner

Jacques Veillard

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 24 February 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 18-38 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 18-38 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date 2/24/2004.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

1. This action is responsive to the Applicant's communication filed on 2/24/2004.
2. Claims 18-38 are pending and presented for examination, upon which claims 18, 21, 23, 26, 30, and 38 have been amended by preliminary amendment.
3. Claims 18, 30, 33, and 37 are the independent claims. Other claims are the dependent.

Information Disclosure Statement

4. The information disclosure statement (IDS) submitted on 2/24/2004 is in compliance with the provisions of 37 CFR 1.97. Accordingly, the information disclosure statement is being considered by the examiner.

Claim Rejections - 35 USC § 112

5. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter, which the applicant regards as his invention.

6. Claims 18-32 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

As per claims 18 and 30, the claims recite the limitation "until reaching those of the operators" the pronoun "those" render the claim indefinite because pronouns are not allowed. Only what is being referred by "those" should be set forth in the claim.

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The dependent claims 19-29, and 31-32, being further limiting to the independent claims 18 and 30, definite and enabled by the specification are also rejected under 35 U.S.C. 112, second paragraph, as being indefinite.

7. Claim 18 recites the limitation "repeating the preceding act" in line 9. There is insufficient antecedent basis for this limitation in the claim.

8. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

9. Claim 29 is rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter, which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. The word "subtree" is not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed.

Claim Rejections - 35 USC § 101

10. 35 U.S.C. 101 reads as follows:

Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

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11. Claim 37 is rejected under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject matter. The preamble recites only a directory for a data structure, which is not tangibly embodied. It appears that it is just a data structure and data structure per se is therefore not statutory.

Claim Rejections - 35 USC § 102

12. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

13. Claims 18-32, are rejected under 35 U.S.C. 102(b) as being anticipated by Graefe et al. (U. S. Pat. No. 5,822,747, hereinafter Graefe).

As per claim 18, Graefe discloses a “system for optimizing a database query” by providing a search engine and database implementor that determines an optional plan for executing a SQL query, wherein the query is represented as query tree consisting of a number of nested expressions (See Graefe Title and Abstract). In particular, Graefe discloses the claimed limitations of “constructing one of the execution plans by selecting one of a plurality of operators from a root group of a data structure having a plurality of groups of alternative operators, certain of the operators having pointers to one or more different ones of the groups” by providing a search engine that generates a number of plans from which an optimal plan is selected (See Graefe Abstract, Figs. 3B-3D in conjunction with elements 316, 318, 320, and 330, and col.9, lines 27-67). Also, Graefe discloses the claimed limitations of “selecting one of a plurality of the operators in at

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least one of the different groups” by providing a memo structure (See Graefe Figs.15A, 15C, 15Q, col.10, lines 10-46, and col.16, lines 27-54 in conjunction with Figs. 14A-14D and Figs. 18A-18D). Furthermore, Graefe discloses the claimed limitations of “repeating the preceding act until reaching those of the operators not having pointers to another one of the groups”, “repeating the above acts, selecting at least one different operator for each of the constructed plans” by providing a mechanism for tracking which pattern of transformations have been performed on each logical expression in a group(See Graefe col.12, line 9 through col.14, line 32 in conjunction with Appendix 1-6).

As per claim 30, the claim has substantially the same limitations as claim 18. These limitations have already been addressed in the rejection of claim 18. Therefore, it is rejected on similar ground corresponding to the arguments given for the rejected claim 18 above.

As per claim 19, most of the limitations of the claim have been noted in the rejection of claim 18. Applicant’s attention is directed to the rejection of claim 18 above. In addition, Graefe discloses the claimed limitations of “where the operators are selected by accessing a directory containing their locations in the data structure” by using the Hash-join method (See Graefe Fig. 13B, 16B, 16C and corresponding text and col.7, lines 41-65).

As per claim 20, Graefe discloses the claimed limitations of “where the directory includes a rank for each operator representing a number of alternative plans associated with that operator” (See Graefe Figs. 15G and 15H and corresponding text).

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As per claim 21, Graefe discloses the claimed limitations of “the act of adjusting the rank of one of the selected operators after it has been selected” (See Graefe Fig. 15G and corresponding text).

As per claim 22, Graefe discloses the claimed limitations of “where the directory includes a rank for each group representing a number of alternative plans associated with that group” (See Graefe Fig. 15U and corresponding text).

As per claim 23, most of the limitations of the claim have been noted in the rejection of claim 18. Applicant’s attention is directed to the rejection of claim 18 above. In addition, Graefe discloses the claimed limitations of “further comprising the act of receiving a specification containing at least one global rank designation, and where the selecting acts select their respective operators in response to the global rank designation” by using an array of pointers to the group of each input (See Graefe col.9, lines 37-51 and lines 62-67).

As per claim 24, Graefe discloses the claimed limitations of “where the respective operators are selected such that the global rank designation uniquely identifies a single one of the alternative execution plans” by providing an array pointers to identify a single one of the alternative execution plans (See Graefe Figs. 3B-3D in conjunction with elements 316, 318, 320, and 330).

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As per claims 25 and 26, Graefe discloses the claimed limitations of “where the specification contains a plurality of global rank designations and further comprising the act of deriving the plurality of global rank designations from the specification “ (See Graefe col.9, lines 37-67).

As per claim 27, Graefe discloses the claimed limitations of “where the operators and pointers form a tree structure”(See Graefe Figs. 18A through 18D, and col.16, lines 43-54).

As per claim 28, Graefe discloses the claimed limitations of “where each operator is selected in each repetition in a manner such that all of the possible alternative plans has approximately the same probability of being unranked”(See Graefe Figs 14A through 14D, 15A, 15Q, col.10., lines 10-46, and col.16, lines 27-42)..

As per claim 29, Graefe discloses the claimed limitations of “where the probability of selecting each operator in each group is related to the number of operators in the subtree of the each operator” (See Graefe col.2, lines 31-40).

As per claim 31, most of the limitations of the claim have been noted in the rejection of claim 30. Applicant’s attention is directed to the rejection of claim 30 above. In addition, Graefe discloses the claimed limitations of “where the medium is a storage medium” (See Graefe col.22, lines 61-67).

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As per claim 32, most of the limitations of the claim have been noted in the rejection of claim 30. Applicant's attention is directed to the rejection of claim 30 above. In addition, Graefe discloses the claimed limitations of. "where the medium is a signal transmitted on a network of computers" (See Graefe Fig.1. system 100 in conjunction with components 102, 104, 106, and col.3, line 65 through col.4, line 5).

Claim Rejections - 35 USC § 103

14. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

15. Claims 33-36 and 38 are rejected under 35 U.S.C. 103(a) as being unpatentable over Graefe et al.(U. S. Pat. No.5,822,747, hereinafter Graefe) in view of Beavin et al. (U. S. Pat. No. 5,940,819, hereinafter Beavin).

As per claim 33, Graefe teaches a system for optimizing a database query (See Graefe Title and Abstract) Similarly, Graefe's system comprising: a search engine responsive to the query for constructing a data structure containing a plurality of groups each including a number of alternative operators (See Graefe Abstract, col.2, line 6 through col.3, line 11, and col.4, lines 6-67), at least some of the operators having pointers to one or more different ones of the groups (See Graefe Figs. 3B-3D in conjunction with elements 316, 318, 320, and 330, and col.9, lines 27-67); a ranking module for ranking the operators in the groups and for unranking them so as to construct a plurality of different execution plans for the query (See Graefe Figs.15G, 15H and 15U

and corresponding text). Graefe did not specifically teach a validation module for validating the execution plans from the ranking module.

However, Beavin teaches a user specification of query access in a relation database including the features of “a validation module for validating the execution plans from the ranking module” by providing a processor for validate and incorporate into the query execution plan (See Beavin Abstract, col.13, lines 37-41).

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the system and method for optimizing database queries of Graefe by incorporating the validation mechanism taught by Beavin. The motivation being to have enhanced the system and method of Graefe by allowing it to validate the query execution plan efficiently; thus, providing an intuitive, easy-to-use access by the user who wants to specify an access path by accepting the path, validating the path and then utilizing the path (See col.3, lines 24-48).

As per claim 34, the combination of Graefe and Beavin, as modified, teaches the claimed limitations of “where the data structure is a table” (See Graefe Fig.1, element 113, col.4, lines 19-24, Fig.12, and col.14, lines 47-54).

As per claim 35, the combination of Graefe and Beavin, as modified, teaches the claimed limitations of “further including a specification for specifying a number of different plans to be constructed” (See Beavin col.1, line 61 through col.2, line 12).

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As per claim 36, the combination of Graefe and Beavin, as modified, teaches the claimed limitations of “further including a directory containing locations of the groups and operators within the data structure containing the groups” (See Graefe Figs. 15G and 15H and corresponding text).

As per claim 38, the combination of Graefe and Beavin, as modified, teaches the claimed limitations of “where the directory includes rank data for each group representing a number of alternative plans associated with that group” (See Graefe Fig. 13B, 16B, 16C and corresponding text and col.7, lines 41-65).

Other Prior Art Made Of Record

| | | |
|-----|-----------------|--------------------------------|
| 16. | Andrei | U. S. Pat. No. 6,618,719, |
| | Young-Lai | U. S. Pub. No.2004/0030677 A1, |
| | Nelson | U. S. Pat. No. 5,778,364, |
| | Berenson et al. | U. S. Pat. No. 6,356,887, |
| | Waas et al. | U. S. Pat. No. 6,598,044. |

Conclusion

17. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

18. **Any response to this action should be mail to:**

Commissioner of Patent and Trademarks

Washington, D.C. 20231

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Or faxed to:

(703) 746-7239 (for formal communication intended for entry)

Or:

(703) 746-7240 (for informal of draft communications, please label
"PROPOSED" or "DRAFT")

Hand - delivered responses should be brought to Crystal Park II, 2021 Crystal Drive,
Arlington, VA, Fourth Floor Lobby (Receptionist Telephone No. (703) 305-3900).

19. Any inquiry concerning this communication or earlier communications from the
examiner should be directed to Jacques Veillard whose telephone number is (703) 305-
7094. The examiner can normally be reached Monday through Friday from 9:30 AM to
4: 30 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's
supervisor, Dov Popovici, can be reached on (703) 305-3830. The fax phone number for
this group is (703) 308-5403.

C. Rones
CHARLES RONES
PRIMARY EXAMINER

J.V.

Jacques Veillard
Patent Examiner TC 2100

August 5, 2004